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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/023,152	12/17/2001	Xiaoning Nie	L&L-I0173	3156

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EXAMINER	
ROBERTS, BRIAN S	

ART UNIT	PAPER NUMBER
2662	

DATE MAILED: 09/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/023,152	NIE, XIAONING	
	Examiner	Art Unit	
	Brian Roberts	2662	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 December 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 December 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-14 have been examined.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-3, 4-6, 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davis (US 5566175) in view of Kappler et al. (US 6064677)

- In reference to claims 1-3, 8

In Figures 1-3, Davis teaches a system and method that includes:

- A FRP control function unit that monitors the state of the data queue/buffer and the associated thresholds T1, T2, and T3 where T2 is the lower limit and alters the service rate based on the comparison between the buffer fill level and the thresholds (column 2-3 lines 66-32)
- A server (8) increases the transmission rate as the data in the buffer store (6) reaches the thresholds T1 and T2

Davis does not explicitly teach the FRP controller assigning an output time to the data packets in the queue.

Kappler et al. teaches assigning a timestamp to a cell using the formula: (column 5 lines 15-58)

VT(f,0)=0

VT(f,j+1)=max{Arrival(f,j+1), VT(f,j)}+Length(f,j+1)/Rate(f)

where:

VT(f,j) is the virtual finishing time associated with packet j of flow (virtual circuit) f;

Arrival(f,j) is the arrival time of packet j of flow f;

Length(f,j) is the length of packet j of flow f;

and waiting until the current time is equal to or greater than the timestamp associated with a particular cell before transmitting the cell. (column 6 lines 19-24)

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the system and method of Davis to include assigning an timestamp using the formula VT(f,j+1)=max{Arrival(f,j+1), VT(f,j)}+Length(f,j+1)/Rate(f) as taught by Kappler et al. based upon comparing the buffer memory fill level with thresholds because it allows altering the service/transmission rate of the packets from the buffer by waiting until the timestamp associated with a particular cell is equal to or greater than current time before transmitting the cell in order to minimize data loss and delay.

- In reference to claim 4-6

The combination of Davis and Kappler et al. teaches a system and method that covers substantially all limitations of the parent claim. Davis further teaches having a low data rate when the buffer level is less than threshold T2 and increasing the data rate to data rate R2 when the buffer level is greater than or equal to the threshold T2

where R2 is the maximum rate and is slightly in excess of the of the peak bit rate. (column 3 lines 33-42)

3. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Davis (US 5566175) in view of Kappler et al. (US 6064677), as applied to the parent claim, and further in view of Caldara et al. (US 5822540)

- In reference to claim 7

The combination of Davis and Kappler et al. teaches a system and method that covers substantially all limitations of the parent claim. Davis further teaches a buffer with a finite total capacity and where a buffer overflow results in the loss of data. (column 4 lines 5-11)

Davis does not teach discarding data packets to be assigned if the buffer memory fill level is greater than a upper limit.

In Figures 1 and 2, Caldara et al. teaches setting a threshold (upper limit) and discarding cells if the number of cells in a buffer exceeds the threshold. (column 4 lines 6-26)

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the system and method of Davis to include discarding data packets if the buffer memory fill level is greater than a threshold (upper limit) as taught by Caldara et al. because it would prevent the buffer form overflowing and unacceptably losing data.

4. Claims 9-12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davis (US 5566175) in view of Kappler et al. (US 6064677), as applied to the parent claim, and further in view of Raj et al. (US 6628649)

- In reference to claim 9-10

The combination of Davis and Kappler et al. teaches a system and method that covers substantially all limitations of the parent claim

Davis does not explicitly teach the network node being a router, gateway, switch, bridge, or hub.

Raj et al. teaches a communication network that includes such communication devices as routers, gateways, switches, bridges, and hubs to transfer data such as voice, video, computer application data across the network. (column 1 lines 4-25)

It would have been obvious to a person of ordinary skill in the art at the time of the invention to implement the system and method of Davis in communication devices as routers, gateways, switches, bridges, and hubs as taught by Raj et al. because it improve the efficient use of network resources when transferring data between a source node and destination node via a communications network.

- In reference to claim 11

Davis teaches a system and method that includes:

- A FRP control function unit that monitors the state of the data queue/buffer and the associated thresholds T1, T2, and T3 where T2 is the lower limit and

alters the service rate based on the comparison between the buffer fill level and the thresholds (column 2-3 lines 66-32)

- A server (8) increases the transmission rate as the data in the buffer store (6) reaches the thresholds T1 and T2

Davis does not teach the FRP controller assigning an output time to the data packets in the queue.

Kappler et al. teaches assigning a virtual finishing time to a cell using the formula: (column 5 lines 15-58)

$VT(f,0)=0$

$VT(f,j+1)=\max\{Arrival(f,j+1), VT(f,j)\}+Length(f,j+1)/Rate(f)$

where:

VT(f,j) is the virtual finishing time associated with packet j of flow (virtual circuit) f;

Arrival(f,j) is the arrival time of packet j of flow f;

Length(f,j) is the length of packet j of flow f;

and waiting until the current time is equal to or greater than the timestamp associated with a particular cell before transmitting the cell. (column 6 lines 19-24)

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the system and method of Davis to include assigning an timestamp using the formula $VT(f,j+1)=\max\{Arrival(f,j+1), VT(f,j)\}+Length(f,j+1)/Rate(f)$ as taught by Kappler et al. because it allows for the implementation of virtual clock or self-clocked weighted fair queuing where priority is given to the packets based upon the time-stamp associated with the packet and waiting until the timestamp associated with a

particular cell is equal to or greater than current time before transmitting the cell in order to minimize data loss and delay.

The combination of Davis and Kappler et al. teaches a system and method that covers substantially all limitations of the parent claim. In Figure 1, Davis further teaches the FRP Unit (1) being a network node.

Davis does not explicitly teach a plurality of such network nodes.

Raj et al. teaches a communication network that includes a plurality of network nodes where the nodes are such communication devices as routers, gateways, switches, bridges, and hubs to transfer data such as voice, video, computer application data across the network. (column 1 lines 4-25)

It would have been obvious to a person of ordinary skill in the art at the time of the invention to implement the system and method of Davis in a plurality of network nodes where the nodes are communication devices as routers, gateways, switches, bridges, and hubs as taught by Raj et al. because it improve the efficient use of network resources when transferring data between a source node and destination node via a communications network.

- In reference to claim 12 and 14

The combination of Davis, Kappler et al. and Raj teaches a system and method that covers substantially all limitations of the parent claim. In Figures 1 and 2, Davis further teaches having a low data rate when the buffer level is less than threshold T2 and increasing the data rate to data rate R2 when the buffer level is greater than or

equal to the threshold T2 where R2 is the maximum rate and is slightly in excess of the of the peak bit rate. (column 3 lines 33-42)

5. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Davis (US 5566175) in view of Kappler et al. (US 6064677), as applied to the parent claim, and further in view of Raj et al. (US 6628649) and further in view of Caldara et al. (US 5822540)

- In reference to claim 13

The combination of Davis, Kappler et al. and Raj teaches a system and method that covers substantially all limitations of the parent claim. Davis further teaches a buffer with a finite total capacity and where a buffer overflow results in the loss of data. (column 4 lines 5-11)

The combination of Davis, Kappler et al. and Raj does not teach discarding data packets to be assigned if the buffer memory fill level is greater than an upper limit.

In Figures 1 and 2, Caldara et al. teaches setting a threshold (upper limit) and discarding cells if the number of cells in a buffer exceeds the threshold. (column 4 lines 6-26)

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the system and method of the combination of Davis, Kappler et al. and Raj to include discarding data packets if the buffer memory fill level is greater than a threshold (upper limit) as taught by Caldara et al. because it would prevent the buffer form overflowing and unacceptably losing data.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure are:

- Nishimura et al. (U5 6473432) discloses a buffer control apparatus and method
- Scott et al. (US 6466579) discloses a bi-modal control system and method for partitioning a shared output buffer in a connection-oriented network connections device
- Kilkki et al. (US 6411617) discloses a system and method for managing data traffic associated with various quality of service principles using a conventional network node switch
- Manning et al. (US 6256674) discloses a method and apparatus for providing buffer state flow control on a per-connection basis
- Walker (US 6230191) discloses a method and apparatus for regulating the amount of buffer memory requested by a pod in a multi-port switching device with shared buffer memory
- Kilkki (US 6219351) discloses an implementation of buffering in a packet-switched telecommunications network
- Shimonishi (US 6173331) discloses a network node for sharing a common buffer among multiple connections while ensuring minimum bandwidth for each connection

- Simmons et al. (US 6167054) discloses a method and apparatus providing programmable thresholds for full-duplex flow control in a network switch
- Isoyama et al. (US 6049527) discloses a cell discard control system for an ATM cell buffer
- Ikeda et al. (US 5913074) discloses a buffer flow control unit for dynamically counting a number of virtual channels per service class in an asynchronous transfer network
- Okuda et al. (US 5892762) discloses a buffer control system
- Loewen et al. (US 6798744) discloses a method and apparatus for interconnection of flow-controlled communication
- Aweya et al. (US 6788697) discloses a buffer management scheme employing dynamic thresholds
- Paquette et al. (US 6657963) discloses a method and apparatus for controlling data congestion in a frame relay/ATM internetworking system
- Shimojo et al. (US 6643256) discloses a packet switch and packet switching method using priority control based on congestion status within packet switch
- Hadi Salim et al. (US 6625118) discloses receiver based congestion control
- Takeuchi (US 6208619) discloses a packet data flow control method and device
- Ghani et al. (US 6160793) discloses an ECN-based approach for congestion management in hybrid IP-ATM networks
- Mcconnell et al. (US 6108307) discloses frame relay priority queues to offer multiple service classes

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian Roberts whose telephone number is (571) 272-3095. The examiner can normally be reached on M-F 8:30-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on (571) 272-3088. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

BSR
09/22/2005

JOHN PEZZLO
PRIMARY EXAMINER